

## AUTHOR INDEX

### A

R. H. Aborn .....	503
J.O.T. Adewara .....	507, 513, 527
G. Anderes .....	141
L. M. Andres .....	641
H. L. Arnson .....	389

### B

J. M. Barry .....	15
C. E. Bates .....	7, 793
J. T. Berry .....	535, 787
B. A. Betts .....	265, 437
J. B. Bidwell .....	55
W. C. Bigelow .....	775
R. A. Bishel .....	487
B. E. Boardman .....	453
B. E. Bond .....	169
B. H. Booth .....	479

J. F. Boylan .....	169
L. O. Brockway .....	775
R. K. Buhr .....	43
R. L. Bye .....	169
J. P. Byrne .....	193
L. E. Byrnes .....	305

### C

E. Campomanes .....	137
G. D. Chandley .....	37
Yi Wen Cheng .....	675
W. W. Cias .....	603
H. R. Conaway .....	487
J. L. Corbett .....	427
A. Couture .....	1
R. L. Crosby .....	437
R. Cunningham .....	345

### D

N. K. Datta .....	431
J. V. Dawson .....	215
D. D. Day .....	805
H. W. Dietert .....	221
G. DiSylvestro .....	745
D. V. Doane .....	603
D. Donis .....	31
G. P. Douglas .....	641
A. B. Draper .....	749
D. R. Durham .....	787
J. E. Dvorak .....	593

### E

P. J. Emerson .....	109
N. N. Engel .....	431
R. E. Eppich .....	427
P. S. Erickson .....	407
H. Escher .....	81
E. R. Evans .....	215

**F**

T. E. Ferguson.....	543
M. C. Flemings.....	169
R. A. Flinn.....	641,665,775
L. L. Fosbinder.....	453
D. J. Frasier.....	665

**G**

H. J. Galloway.....	385
N. V. Gandhi.....	577
R. Goller.....	137
M. J. Gough.....	351
A. L. Graham.....	221
K.-E. Granitzki.....	769
R. A. Green.....	97,281,385
R. E. Greenwood.....	417

**H**

H. D. Hanes.....	571
G. D. Hanson.....	385
J. M. Hardy.....	407
R. W. Heine.....	97,129,203, 257,281,493,675
H. R. Helg.....	141
D. A. Hentz.....	385
J. R. Hitchings.....	653
S. A. Hoenig.....	55

**I**

B. Innes.....	321
---------------	-----

**J**

B. E. Jacobs.....	229
L. Janowski.....	203
A. Jeyarajan.....	647

**K**

P. K. Kennedy.....	621
Y. D. Kim.....	287
R. M. Kotschi.....	631
B. P. Krishnan.....	73

**L**

B. Lagowski.....	151
M. J. Lalich.....	215,653
J. D. Lavendar.....	155
H. S. Lee.....	559
W. C. Leslie.....	305
T. R. Lietzke.....	683
C. R. Loper Jr.....	203,257,507, 513,527,631,765
W. Lubbeck.....	499

**M**

R. M. MacDonald.....	91
R. D. Maier.....	687
U. D. Mallya.....	615
D. O. McCain.....	237
P. J. Mikelonis.....	449
P. H. Mikkola.....	493
T. Miura.....	233
J. Morgan.....	351
A. E. Murton.....	43

**N**

S. Nakada.....	183
P. J. Neff.....	701
R. W. Neuman.....	593
L. A. Neumeier.....	265,437
J. R. Nieman.....	175

**O**

D. Oakland.....	551
A. R. Oltregge.....	397
T. R. Ostrom.....	665

**P**

W. A. Palko.....	193
V. Panchanathan.....	615
S. Parent-Simonin.....	471
R. D. Pehlke.....	647
E. U. Petitbon.....	305
P. J. Pickards.....	101
R. M. Pillai.....	615
D. R. Poirier.....	577
R. M. Praski.....	221

**R**

A. Ramachandran.....	465
E. G. Ramachandran.....	465
G. Ramakrishnan.....	133,147
T. Rangaswami.....	133,147
M. P. Renato.....	641
R. G. Riek.....	169
T. H. Rockwell.....	21
M. Robinson.....	585
P. K. Rohatgi.....	73
H. C. Rolseth.....	295
P. C. Rosenthal.....	257
H. Md. Roshan.....	133,147,465
G. F. Ruff.....	705
C. F. Russ.....	55

**S**

H. Saito.....	243
S. Sakatsume.....	243
J. H. Sale.....	627
A. J. Salg.....	765
S. D. Sanders.....	65
J. S. Schumacher.....	97,281,385
W. D. Scott.....	793
W. W. Seaton.....	729
N. Seki.....	243
M. R. Seshadri.....	465
H. R. Shetty.....	73
D. A. Siebert.....	571
W. Simmons.....	109
R. T. Sohr.....	299
H. A. Stephens.....	249
G. R. Strong.....	129
G. V. Sullivan.....	65
J. F. Sullivan.....	257
L.J.D. Sully.....	735
K. Suzuki.....	183

**T**

M. Talballa.....	775
C. W. Ten Haagen.....	535
A. Trautwein.....	141
P. K. Trojan.....	665,775
D. V. Trumbauer.....	25

**U**

A. E. Umble.....	49
------------------	----

**V**

D. Verma.....	787
A. P. Volkmar.....	683

**W**

J. F. Wallace.....	687,705
C. C. Wang.....	203
P. G. Wolf.....	421
F. J. Worzala.....	675
J. E. Wren.....	7
J. C. Wright.....	155

**Y**

J. A. Yaker.....	305
K. P. Young.....	169

**Z**

C. A. Zanis.....	193
R. E. Zimmerman.....	15

# SUBJECT INDEX

## A

Abrasion-resistant steels	
Martensitic, air-hardenable, abrasion-resistant steels	
containing Si, Mn, Cr, Ni and Mo	603
Additives (see Sand additives)	
Air-dried fineness test	221
Air gap	
Formation at casting/chill interface and effect	
on heat transfer coefficient	735, 787
Air pollution (see Dust control; Emission control)	
Aluminum	
Centrifugal casting with segregated graphite	73
Solidification rate in shell molds	465
Soundness and solidification related to gradient	
acceleration parameter	615
Aluminum cast iron	
Structure and high temperature properties,	
ductile and gray	305
Ammonia detection in mold and core gases	221
Annealing malleable iron continuously in	
electric furnaces	543
Antimony	
Gray and ductile iron additive, effect on	
structure and properties	503
Arc furnace	
Design, reliability and utilization efficiency	551
Electrical maintenance, reactance measurement	397
Energy management	499
Use of turnings and borings	31
Voltage/power selection factors	397
Arc welding ductile iron with flux-cored wire	487
Austenite	
Dendrite formation in gray iron	
and effect on properties	705
Automatic molding	
Coresetting	25
Automatic pouring systems available, methods of	
operation and economics	729

## B

Bearings	
Graphitized aluminum	73
Bentonite clay (see Clay)	
Binder emissions (see Emission control)	
Brass	
Gas defects, sources and identification	249
Bronze	
Casting improvement by hot isostatic processing	571
Gas defects, sources and identification	249

## C

Calcium carbide	
Desulfurization of ductile iron	137, 775
Calcium oxide	
Desulfurization of ductile iron	775
Carbon forms resulting from pyrolysis	749
Carbon equivalent	
Gray iron, determination by thermal analysis	805
Casting defects (see specific defect)	
Cast iron (see also Gray, Malleable and Ductile irons)	
Chromite sand application	65
Compacted graphite	215
Desulfurization by CaC <sub>2</sub> and CaO	775
Inoculation in-stream by automatic cored wire	175

Centrifugal casting of aluminum with	
segregated graphite	73
Ceramic molding	417
Charge materials (see specific material)	
Chemical absorption for control of	
cold box emissions	299
Chemical binders	
Gases from decomposition and casting surface	
quality of gray iron	793
Chill	
Effect on heat transfer in sand	
or permanent molding	735, 787
Effect on solidification time	
simulated by computer	647
Chipping hammers	
Noise control	21
Chromite sand	
Domestic, foundry evaluation	65
Penetration resistance in	
steel casting	183
Sintering characteristics	183
Chromium	
Ductile iron additive, effect on	
properties and structure	265
CLA process	37
Clay	
High pressure molding, effects on mold properties	133
High pressure molding, effects on sand properties	147
Thermal degradation in green sand	97
Clay bonded sand (see also Green sand)	
Reclamation and reuse	453
Temperature effects on properties	385
Coke	
Cupola performance	7
Combustion	
Efficiency study for radiant tube burner	345
Compacted graphite cast iron production	
and properties	215
Computer simulation of casting	
solidification involving end-chill	647
Continuous electric annealing of malleable iron	543
Copper alloys (see also particular type i.e. brass, bronze etc.)	
Gas content measuring apparatus	665
Gas defects, sources and identification	249
Microstructure and impurity effects	1
Solidification rate in shell mold	465
Solubility relations of carbon and	
oxygen in cupronickel	641
Thixocasting	169
Copper in ductile iron; effect on	
properties and structure	265
Cores	
Gas evolution measurement	221
Phenolic nobake binders	287
Coresetting	
Automatic molding	25
Crack initiation and propagation	
Ductile iron, carbide effect	507
Ductile iron, Ferritic	527
Ductile iron, Pearlite effect	513
Cupola	
Coke strength and performance	7
Divided hot blast, unlined 90-in.	
cupola operating experience	427
Fluorspar-free fluxes	593
Malleable iron melting; cupola vs	
induction furnace	389
Oxygen enrichment to conserve energy	295
Recuperators for blast heating with emission control	81
Cupronickel	
Carbon-oxygen solubility relationships	641

**D**

Defects in gray iron	
Titanium for control using ilmenite as source	449
Defects (see also specific defect)	
Degassing of steel HY-130	193
Design of arc furnaces	551
Design of L- and T-junctions; graphical determination of freezing sequence	631
Deoxidation	
Copper-nickel alloys	641
Desulfurization	
Cast iron, by calcium carbide and calcium oxide	775
Ductile iron, by calcium carbide injection	137
Dimensional stability of castings, high density, green sand molding	745
Divided hot blast	
Cupola operating experience	427
Double torsion test	
Fracture toughness of ductile and gray iron	535
Dross	
Formation in heavy section	
ductile iron castings	765
Ductile iron	
Aluminum-alloyed, structure and high temperature properties	305
Antimony effect on structure and properties	503
Arc welding with flux-cored wire	487
Chromium effect on properties and structure	265
Copper effect on properties and structure	265
Crack initiation and propagation by carbides	507
Crack initiation and propagation in ferritic ductile iron	527
Crack initiation and propagation effect of pearlite	513
Desulfurization by calcium carbide and calcium oxide	775
Desulfurization by calcium carbide injection	137
Distribution of Si, Cu, Ni, Mn, Mo and Cr during isothermal transformation	431
Exfoliated dross in thick castings	765
Forging, hot rolling and effect on properties	437
Fracture toughness study	675
Fracture toughness using double-torsion test	535
Graphite form effect on mechanical properties, ultrasonic velocity and resonant frequency	109
Lead effect on properties and structure	265
Magnesium fade study	203
MAP process operating experience	627
Mechanical properties measured by sonic and ultrasonic testing	109
Mechanical properties and graphite form effect	109
Nonmetallic inclusions as nuclei for spheroidal graphite	653
Postinoculation with Mg-bearing alloy for high recovery	585
Produced from malleable base iron	237
Rising; feeding requirements affected by section modulus, mold rigidity, CE, section size	351
Tin effect on properties and structure	265
Dust Control	
Electrostatic fogging	55
High-speed floor stand grinder ventilation	321

**E**

Electron microprobe study	
Ductile iron and distribution of Si, Cu, Mn, Mo and Cr during isothermal transformation	431
Electrostatic fogging	
Dust control	55

**Emission control**

Chemical absorption, for cold box process	299
Cupolas, with hot blast recuperators	81
Energy conservation	
Arc furnace operation	499
Cupola melting with oxygen enrichment	295
Efficiency study for radiant tube burner	345
Recuperators for cupolas	61
Waste heat recovery with recuperators	421
Exfoliated dross in heavy section	
ductile iron castings	765

**F**

Ferrite suppression in shell molded gray iron	101
Floor stand grinder ventilation requirements	321
Fluorspar substitutes, for cupola melting	593
Fluxes for cupola melting, fluorspar-free	593
Forging and hot rolling	
Ductile iron castings and effect on properties	437
Fracture toughness	
Ductile and malleable iron	675
Ductile and gray iron using double-torsion test	535
Full mold process	
Gray iron casting with unbonded sand	559
Unbonded sand, gas evolution measurements	559
Furnaces (see specific type)	
Future of the foundry industry	229

**G**

Gas content measuring apparatus for copper alloys	665
Gas defects	
Brass and bronze sources and identification	249
Gas evolution	
Foundry materials, source and measurement	221
Full mold process with unbonded sand	559
Gas solubility	
Carbon-oxygen relationship in copper-nickel alloys	641
Gradient acceleration parameter (GAP)	
Aluminum castings, related to soundness	615
Graphite	
Segregation in cast aluminum	73
Graphite form	
Evaluation by sonic and ultrasonic testing	109
Graphite structure	
Gray iron and effects on mechanical properties	705
Gray iron	
Aluminum-alloyed, structure and high temperature properties	305
Antimony effect on structure and properties	503
Cutting tool wear and effect of MnS inclusions	407
Ferrite suppression in shell molding	101
Fracture toughness using double-torsion test	535
Full mold casting with unbonded sand	559
Inclusions of MnS and effect on cutting tool wear	407
Mechanical properties controlled by graphite structure	705
Nitrogen porosity; titanium for control using ilmenite as source of titanium	449
Surface quality related to chemical binder decomposition gases	793
Quality control by thermal analysis	805
Green sand (see also Clay bonded sand)	
Clay degradation by heat	97
Cooling by moisture evaporation	281
High density molding, factors affecting dimensional stability of castings	745
Sand/metal ratio effect on cooling	281

**H**

Health	
Chemical absorption of cold box emissions	299
Dust control by electrostatic fogging	55
Dust control of high-speed floor stand grinders	321
Noise control of chipping hammers	21
Silica determination in dusts in the presence of zircon	701
Silica, respirable mass sampling	15
Heat resistance	
Cast irons alloyed with aluminum	305
Heat transfer	
Graphical determination of freezing sequence for L- and T-junctions	631
Heat transfer coefficient	
Factors affecting variation at casting/chill interface	735, 787
Molding sands	243
Heat treatment	
Quenching malleable iron in water with soluble polymer	129
Annealing malleable iron continuously in electric furnaces	543
High density green sand molding	
Dimensional stability factors	745
High pressure molding	
Sand additives and clay effect on mold properties	133
Sand additives and clay effect on system sands	147
Sand systems	133, 147
Hot blast	
Cupolas, using recuperators	81
Hot isostatic processing (HIP)	
Bronze casting application	571
Hot sand	
Effect on properties	385
HY-130 steel casting development	193
Hydriding ZE63 magnesium alloy	151

**I**

Ilmenite	
Titanium source in cupola melted gray iron to control nitrogen porosity defects	449
Induction furnaces	
Coreless type (110 metric tons) refractory lining	769
Malleable iron melting; cupola vs induction furnace	389
Industrial engineering	
Departmental organization related to manufacturing	621
Inoculation (see also Postinoculation)	
Inoculation of cast iron	
In-stream, by automatic cored wire	175
Investment casting	
CLA process	37
Vacuum pouring	37
Isothermal transformation	
Ductile iron; distribution of Si, Cu, Mn, Mo and Cr	431

**K**

Krischer method	
Heat transfer coefficient determination	243

**L**

Lead in ductile iron, effect on properties and structure	265
Loss on ignition test	
Combustibles determination in green sand premixes	685
Lustrous carbon	
Factors affecting occurrence in green sand molds; tests	749

**M**

Machineability	
Cutting tool wear and effect of MnS inclusions in gray iron	407
Malleable iron, Renault-Mathon test	471
Magnesium	
Metallography of hydrided ZE63 alloy	151
Magnesium fade study in ductile iron	203
Magnesium treatment	
Ductile iron, MAP process	627
Malleable iron	
Continuous electric anneal	543
Conversion to ductile iron	237
Cupola vs induction melting	389
Fracture toughness study	675
Machinability testing by Renault-Mathon method	471
Quenching in water with soluble polymer	129
Temper carbon shape, controlling factors	687
Manganese	
Sulfide inclusions in gray iron; effect on tool life	407
Manganese/sulfur ratio	
Temper carbon shape, graphitization rate and property dependence in malleable iron	687
MAP process	
Ductile iron operating experience	627
Mechanical properties	
Ductile iron evaluation by sonic and ultrasonic testing	109
Ductile iron; forged and hot rolled	437
Ductile iron; graphite form effect	109
Gray iron, controlled by graphite structure	705
Steel casting HY-130	193
Steel castings and effect of tin	257
Mechanization	
Automatic pouring, methods of operation and economics	729
Melting (see specific furnace)	
Metallography of hydrided magnesium ZE63 alloy	151
Metal penetration	
Steel castings, resistance of chromite sand	183
Methylene blue (MB) test	
Clay determination in green sand premixes	685
Microstructure	
Compacted graphite cast iron	215
Copper base castings and impurity effects	1
Hydrided ZE63 magnesium alloy	151
Steel castings, effect of tin	257
Mold gases	
Related to decomposition of chemical binders	793
Mold/metal interface	
Chemical binder decomposition and casting surface quality of gray iron	793
Lustrous carbon formation	749

**N**

Nil ductility temperature (NDT)	
Ductile and malleable iron comparison	675
Nitrogen porosity	
Gray iron, control by titanium addition from ilmenite	449
Nobake binders	
Phenolic binders for core and mold production	287
Property comparisons	287
Nodularity	
Mg fade effect in ductile iron	203
Nodulization	
Nonmetallic inclusions as nuclei in spheroidal graphite formation	653
Noise control of chipping hammers	21
Nonmetallic inclusions in ductile iron as nuclei for spheroidal graphite	653
Nucleation of spheroidal graphite by nonmetallic inclusions	653

**O**

Oil core sand reclamation and reuse	453
Olivine	
Heat transfer coefficient determination	243
OSHA	
Silica compliance using respirable mass	15
Oxygen enrichment	
Energy conservation in cupola melting	295

**P**

Permanent molding	
Heat transfer coefficient at casting/chill interface	735, 787
Phenolic binders for nobake core and mold production	287
Porosity	
Copper alloys; control by vacuum-solidification test	665
Postinoculation	
Ductile iron, using Mg-bearing alloy for high recovery	585
Pouring	
Automated/mechanized systems	729
Premixes	
Quality control test procedure	685

**Q**

Quality control	
Gray iron, by thermal analysis	805
Quenching	
Malleable iron in water with soluble polymer	129

**R**

Radiant tube burner efficiency study	345
Rebonding	
Reclaimed silicate sand; self setting	91
Reclamation (see Sand reclamation)	

Recuperators	
Cupola blast heating with emission control	81
Waste heat recovery	421
Refractory lining	
Coreless Induction furnace (110 metric tons)	769
Renault-Mathon test for machinability of malleable irons	471
Resin binders (see Chemical binders)	793
Respirable mass	
Silica compliance with OSHA	15
Rising of ductile iron	
Feeding requirements affected by section modulus, mold rigidity, CE, section size	351
Risers	
Design optimization with insulating sleeves	577
Riser sleeves	
Steel casting	49
Use to optimize riser design	577
Runners	
Whirl-type for large steel castings	141

**S**

Sand	
Cooling by moisture evaporation	281
Heat transfer properties	243
Sand additives	
Green sand molding, sources	
of lustrous carbon	749
High pressure molding, effects on mold properties	133
High pressure molding, effects on sand properties	147
Sand binders (see also specific binder system)	
Gas evolution measurement	221
Sand control	
Past, present and future	479
Sand molds	
Gas evolution measurement	221
Phenolic nobake binders	287
Sand reclamation	
Clay bonded sand	453
Oil core sand	453
Silicate sand; self setting	91
Sand systems	
High pressure molding	133, 147
Shell molding	
Gray iron; ferrite suppression	101
Shell molds	
Solidification rate effect for Al and Cu alloys	465
Silica dust determination in presence of zircon	701
Silica	
Respirable mass, OSHA compliances	15
Silicon in gray iron, determination by thermal analysis	805
Slag	
Viscosity reduction with fluorspar-free fluxes in cupola melting	593
Sleeves (see Riser sleeves)	
Solidification	
Aluminum castings; soundness related to gradient acceleration parameter	615
Chill molds, effect of metal/chill combination casting design and superheat	787
Rate controlled by heat transfer coefficient at casting/chill interface	735, 787
Sequence determined graphically for L- and T-junctions	631
Simulation by computer	647
Solidification rate	
Al and Cu alloys in shell molds	465

Sonic testing	
Mechanical properties of ductile iron .....	109
Steel	
Chromite sand application .....	65
Defect detection by ultrasonic inspection .....	155
Martensitic, air-hardenable, abrasion-resistant, Si, Mn, Cr, Ni and Mo.....	603
Ultrasonic detection of internal flaws .....	155
Steel casting	
HY-130 development .....	193
Metal penetration resistance of chromite sand.....	183
Riser sleeve size calculation.....	49
Tin effects on structure and mechanical properties.....	257
Whirl runners.....	141

## T

Temper carbon shape, control factors in malleable iron.....	687
Testing	
Gas evolution from cores and molds .....	221
Thermal analysis	
Procedure for quality control of gray iron.....	805
Substitute for chemical analysis and testing of gray iron .....	805
Thermal resistance	
Casting/chill interface and factors affecting .....	735,787
Thixocasting	
Copper base alloys.....	169
Tin in ductile iron, effect on properties and structure.....	265
Tin in steel castings and effect on mechanical properties.....	257
Titanium from ilmenite to control defects in gray iron .....	449
Tool life	
Effect of MnS inclusions in gray iron.....	407
Tramp elements in copper base castings and effect on microstructure .....	1
Transformers	
Arc furnace melting application.....	397
Turnings and borings	
Arc furnace melting.....	31

## U

Ultrasonic testing	
Mechanical properties of ductile iron .....	109
Steel, detection of interval defects .....	155
Steel, replacement for radiography .....	155
Unicast process.....	417

## V

Vacuum molding process (see V-process)	
Vacuum pouring	
Investment casting.....	37
Vacuum-solidification test	
Gas content in copper alloys .....	665
Ventilation requirements	
High-speed floor stand grinder .....	321
V-process	
Process parameters .....	43
Production methods and equipment .....	233

## W

Waste heat recovery with recuperators .....	421
Welding	
Arc welding ductile iron with flux-cored wire .....	487
Whirl runners for large steel castings .....	141

## Y

Yield	
Calculations and effect of part design, risers, scrap, melt loss and gating .....	493

## Z

Zircon	
Influence in respirable silica determination .....	701



